

Appl. No. : 10/555,728
Filing date : January 6, 2006

AMENDMENTS TO THE CLAIMS

1. **(Currently amended)** A transmission system comprising first and second rotatable shafts, and means for transferring drive from one of the shafts to the other shaft comprising first and second gear wheels each rotatably mounted on the first shaft and having drive formations formed thereon, a selector assembly for selectively transmitting torque between the first shaft and the first gear wheel and between the first shaft and the second gear wheel, wherein the selector assembly comprises an actuator assembly and first and second sets of engagement members that are moveable into and out of engagement with the first and second gear wheels independently of each other, said selector assembly being arranged such that when one of the gear wheels is selected by the first and second sets of engagement members and a driving force is transmitted, one of the first and second sets of engagement members drivingly engages the engaged gear wheel, and the other set of engagement members is then in an unloaded condition, wherein the actuator assembly is arranged to move the unloaded set of engagement members into driving engagement with the unengaged gear wheel to effect a gear change before the loaded set disengages the engaged gear wheel when performing accelerating upshifts and decelerating downshifts, and wherein when performing kickdown shifts the engagement members are arranged to disengage the engaged gear wheel in response to a brief torque interruption prior to the shift.
2. **(Currently amended)** The transmission system according to claim 1, wherein the selector assembly is arranged such that when a braking force is transmitted the first set of engagement members drivingly engages the engaged gear wheel, and the second set of engagement members is in an unloaded condition, and when a driving force is transmitted the second set of engagement members drivingly engages the engaged gear wheel, and the second first set of engagement members is then in an unloaded condition.
3. **(Previously presented)** The transmission system according to claim 1, wherein the actuator assembly is arranged to bias the loaded set of engagement members towards the unengaged gear wheel without disengaging the loaded set of engagement members from the engaged gear wheel.

Appl. No. : 10/555,728
Filing date : January 6, 2006

4. **(Previously presented)** The transmission system according to claim 1, wherein the first and second sets of engagement members are arranged to rotate, in use, with the first shaft.
5. **(Previously presented)** The transmission system according to claim 1, wherein the first shaft is an input shaft and the second shaft is an output shaft and drive is transferred from the input shaft to the output shaft.
6. **(Previously presented)** The transmission system according to claim 1, wherein the selector assembly is arranged such that when the first and second sets of engagement members engage one of the first and second gear wheels the backlash when moving between acceleration and deceleration is less than or equal to four degrees.
7. **(Previously presented)** The transmission system according to claim 1, wherein the drive formations on the first and second gear wheels comprise a first and second groups of dogs respectively.
8. **(Previously presented)** The transmission system according to claim 7, wherein the first and second groups of dogs each comprise between two and eight dogs, evenly distributed on the first and second gears respectively.
9. **(Previously presented)** The transmission system according to claim 8, wherein the first and second groups of dogs each comprise between two and four dogs.
10. **(Previously presented)** The transmission system according to claim 1, wherein the first and second sets of engagement members comprise between two and eight members.
11. **(Previously presented)** The transmission system according to claim 10, wherein the first and second sets of engagement members comprise between two and four members.
12. **(Previously presented)** The transmission system according to claim 1, wherein the first shaft comprises keyways arranged such that the first and second sets of engagement members can slide axially along the keyways and to radially restrain the positions of the sets of engagement members.

Appl. No. : 10/555,728
Filing date : January 6, 2006

13. **(Previously presented)** The transmission system according to claim 12, wherein a cross-section of the keyways is one of T-shaped, slotted, and dovetailed.
14. **(Previously presented)** The transmission system according to claim 1, wherein the actuator assembly comprises at least one resiliently deformable means arranged to move at least one of the first and second sets of engagement members into engagement with the first and second gear wheels when the engagement members are in unloaded conditions.
15. **(Previously presented)** The transmission system according to claim 14, wherein the at least one resiliently deformable means is arranged to bias at least one of the first and second sets of engagement members towards the first or second gear wheel when the engagement members are drivingly engaged with a gear wheel.
16. **(Currently amended)** The transmission system according to claim 14, wherein the actuator assembly comprises first and second resiliently deformable means connected to the first and second sets of engagement members respectively such that the first resiliently deformable means acts on the first set of engagement members and the second resiliently deformable means acts on the second set of engagement members.
17. **(Previously presented)** The transmission system according to claim 14, wherein the at least one resiliently deformable means is connected to the first and second sets of engagement members such that the resiliently deformable means acts on both the first and second sets of engagement members.
18. **(Previously presented)** The transmission system according to claim 12, wherein the members of the first and / or second sets of engagement members can perform limited axial movement relative to each other in the keyways.
19. **(Previously presented)** The transmission system according to claim 14, wherein the resiliently deformable means is a spring.

Appl. No. : 10/555,728
Filing date : January 6, 2006

20. **(Previously presented)** The transmission system according to claim 25, wherein the disc spring comprises a plurality of arms, each arm having a first part that extends circumferentially around a portion of the disc spring and a second part that extends substantially radially inwards.
21. **(Currently amended)** The transmission system according to claim 14, wherein the actuator assembly comprises a fork that is arranged to engage the at least one resiliently deformable means to move the at least one ~~radially~~ resiliently deformable means axially along the first shaft.
22. **(Previously presented)** The transmission system according to claim 1, wherein the drive formations are arranged such that they do not extend beyond the outside diameter of the gear wheels.
23. **(Previously presented)** The transmission system according to claim 8, wherein the first and second groups of dogs each comprise three dogs.
24. **(Previously presented)** The transmission system according to claim 10, wherein the first and second sets of engagement members comprise three members.
25. **(Previously presented)** The transmission system according to claim 19, wherein the resiliently deformable means is a disc spring.
26. **(New)** A method for performing a kickdown shift in a transmission system including first and second rotatable shafts, and means for transferring drive from one of the shafts to the other shaft including first and second gear wheels each rotatably mounted on the first shaft and having drive formations formed thereon, a selector assembly for selectively transmitting torque between the first shaft and the first gear wheel and between the first shaft and the second gear wheel, wherein the selector assembly includes an actuator assembly and first and second sets of engagement members that are moveable into and out of engagement with the first and second gear wheels independently of each other, said selector assembly being arranged such that one of the gear wheels is selected by the first and second sets of engagement members and a driving force is transmitted, one of the first and second sets of engagement members drivingly engages the engaged gear wheel, and the other set of engagement members is then in an unloaded condition,

Appl. No. : 10/555,728
Filing date : January 6, 2006

wherein the actuator assembly is arranged to move the unloaded set of engagement members into driving engagement with the unengaged gear wheel to effect a gear change, including briefly interrupting torque in the transmission to allow disengagement of the engaged gear wheel prior to the shift, and then selecting the unengaged gear wheel.

27. (New) A transmission system including a first shaft, a first gear ratio having a first gear wheel rotatably mounted on the first shaft, a second gear ratio having a second gear wheel rotatably mounted on the first shaft, a selector assembly for selectively transmitting torque between the first shaft and the first gear wheel and for selectively transmitting torque between the first shaft and the second gear wheel, said selector being arranged to select from the following operational modes for the first and second gear wheels: lock the gear wheel for rotation with the first shaft in a clockwise direction and not lock in a counter-clockwise direction; lock the gear wheel for rotation with the first shaft in the counter-clockwise direction and not lock in the clockwise direction; and lock the gear wheel for rotation with the first shaft in the clockwise and counter-clockwise directions, wherein when performing kickdown shifts the selector assembly is arranged to release the second gear wheel from rotation with the first shaft in response to a brief torque interruption prior to the selecting the first gear wheel.

28. (New) A transmission system according to claim 27, wherein the selector assembly is arranged to select the following operational mode with respect to the first and second gear wheels: the gear wheel is not locked for rotation with the first shaft in the clockwise or counter-clockwise directions.

29. (New) A transmission system according to 27, wherein the selector assembly is arranged to select the unengaged gear wheel whilst the engaged gear wheel is locked for rotation with the first shaft when performing accelerating upshifts and decelerating downshifts.

30. (New) A transmission system according to any one of claims 27, wherein the selector assembly includes an actuator assembly and first and second sets of engagement members that are arranged to selectively lock the first and second gear wheels for rotation with the first shaft, said selector assembly being arranged such that when a driving force is transmitted, one of the

Appl. No. : 10/555,728
Filing date : January 6, 2006

first and second sets of engagement members transmits torque between the engaged gear wheel and the first shaft, and the other set of engagement members is then in an unloaded condition.

31. (New) A transmission system according to claim 30, wherein the actuator assembly is arranged to use the unloaded set of engagement members to select an unengaged gear ratio to effect a gear change.

32. (New) A transmission system according to claim 30, wherein selector assembly is arranged such that when a braking force is transmitted the first set of engagement members drivingly engages the engaged gear wheel, and the second set of engagement members is in an unloaded condition, and when a driving force is transmitted the second set of engagement members drivingly engages the engaged gear wheel, and the first set of engagement members is then in an unloaded condition.

33. (New) A method for performing a kickdown shift in a transmission system including a first shaft, a first gear ratio having a first gear wheel rotatably mounted on the first shaft, a second gear ratio having a second gear wheel rotatably mounted on the first shaft, a selector assembly for selectively transmitting torque between the first shaft and the first gear wheel and for selectively transmitting torque between the first shaft and the second gear wheel, said selector being arranged to select from the following operational modes for the first and second gear wheels: lock the gear wheel for rotation with the first shaft in a clockwise direction and not lock in a counter-clockwise direction; lock the gear wheel for rotation with the first shaft in the counter-clockwise direction and not lock in the clockwise direction; and lock the gear wheel for rotation with the first shaft in the clockwise and counter-clockwise directions, including briefly interrupting torque in the transmission when a kickdown shift is required between the first and second ratios to enable the selector assembly to release the second gear wheel from rotation with the first shaft, and then selecting the first gear wheel.